

螺纹底孔直径

一、螺纹底孔直径计算式

螺纹底孔直径可参照表 1、表 2 的公式计算，也可查表 3 至表 11。

表 1 加工米制普通螺纹底孔钻头直径 D 的计算公式

| | | 适用范围 |
|---|-------------------------------------|--|
| 1 | $D = d - t$ 式中 d：螺纹的公称直径 t：螺距 | (1) 螺距 $t < 1$ ； (2) 工件材料塑性较大； (3) 孔扩张量适中。 |
| 2 | $D = d - (1.04 \sim 1.08)t$ | (1) 螺距 $t < 1$ ； (2) 工件材料塑性较小； (3) 孔扩张量较小。 |

表 2 加工英制螺纹底孔钻头直径的计算公式

(mm)

| 螺纹公称直径 (英寸) | 铸铁与青铜 | 钢与黄铜 |
|----------------|----------------------------|----------------------------------|
| 3/16" ~ 5/8" | $D = 25.4 \cdot (d - 1/n)$ | $D = 25.4 \cdot (d - 1/n) + 0.1$ |
| 3/4" ~ 1 1/2" | $D = 25.4 \cdot (d - 1/n)$ | $D = 25.4 \cdot (d - 1/n) + 0.2$ |

注：n—每英寸牙数

二、螺纹底孔直径表

表 3 米制粗牙螺纹攻丝前用的钻头直径 (mm)

| 螺 纹 | | | | | | 钻头 直径 |
|------|------|-----------|-----------|-----------|-----------------|----------|
| 公称直径 | 螺距 | 小 直 径 级 别 | | | | |
| | | 5H max | 6H max | 7H max | 5H、6H、7H min | |
| 1 | 0.25 | 0.785 | | | 0.729 | 0.75 |
| 1.2 | 0.25 | 0.985 | | | 0.929 | 0.95 |
| 1.6 | 0.35 | 1.301 | 1.321 | | 1.221 | 1.25 |
| 2 | 0.4 | 1.657 | 1.679 | | 1.561 | 1.60 |
| 2.5 | 0.45 | 2.112 | 2.138 | | 2.013 | 2.05 |
| 3 | 0.5 | 2.571 | 2.599 | 2.639 | 2.459 | 2.50 |
| 4 | 0.7 | 3.382 | 3.422 | 3.466 | 3.242 | 3.30 |
| 5 | 0.8 | 4.294 | 4.334 | 4.384 | 4.134 | 4.20 |
| 6 | 1 | 5.007 | 5.153 | 5.217 | 4.917 | 5.00 |
| 8 | 1.25 | 6.859 | 6.912 | 6.982 | 6.647 | 6.80 |
| 10 | 1.5 | 8.612 | 8.676 | 8.751 | 8.376 | 8.50 |
| 12 | 1.75 | 10.371 | 10.441 | 10.531 | 10.106 | 10.2 |
| 14 | 2 | 12.135 | 12.210 | 12.310 | 11.835 | 12.0 |
| 16 | 2 | 14.135 | 14.210 | 14.310 | 13.835 | 14.0 |
| 18 | 2.5 | 15.649 | 15.744 | 15.854 | 15.294 | 15.5 |
| 20 | 2.5 | 17.649 | 17.744 | 17.854 | 17.294 | 17.5 |
| 22 | 2.5 | 19.649 | 19.744 | 19.854 | 19.294 | 19.5 |
| 24 | 3 | 21.152 | 21.252 | 21.382 | 20.754 | 21.0 |

表 4 米制细牙螺纹攻丝前用的钻头直径 (mm)

| 螺 纹 | | 小 直 径 级 别 | | | | 钻头 直径 |
|------|------|-----------|-----------|-----------|-----------------|----------|
| 公称直径 | 螺距 | 5H max | 6H max | 7H max | 5H、6H、7H min | |
| 2.5 | 0.35 | 2.201 | 2.221 | | 2.121 | 2.15 |
| 3 | | 2.701 | 2.721 | | 2.621 | 2.65 |
| 4 | 0.5 | 3.571 | 3.599 | 3.639 | 3.459 | 3.50 |
| 5 | | 4.571 | 4.599 | 4.639 | 4.459 | 4.50 |
| 6 | 0.75 | 5.338 | 5.378 | 5.424 | 5.188 | 5.70 |
| 8 | | 7.338 | 7.378 | 7.424 | 7.188 | 7.20 |
| 10 | | 9.338 | 9.378 | 9.424 | 9.188 | 9.20 |
| 8 | 1 | 7.107 | 7.217 | 7.217 | 6.917 | 7.00 |
| 10 | | 9.107 | 9.217 | 9.217 | 8.917 | 9.00 |
| 12 | | 11.107 | 11.217 | 11.217 | 10.917 | 11.0 |
| 14 | | 13.107 | 13.217 | 13.217 | 12.917 | 13.0 |
| 16 | | 15.107 | 15.217 | 15.217 | 14.917 | 15.0 |
| 18 | | 17.107 | 17.217 | 17.217 | 16.917 | 17.0 |
| 20 | | 19.107 | 19.217 | 19.217 | 18.917 | 19.0 |
| 22 | | 21.107 | 21.217 | 21.217 | 20.917 | 21.0 |
| 24 | | 23.107 | 23.217 | 23.217 | 22.917 | 23.0 |
| 10 | 1.25 | 8.859 | 8.912 | 8.982 | 8.647 | 8.80 |
| 12 | | 10.859 | 10.912 | 10.982 | 10.647 | 10.8 |
| 14 | | 12.859 | 12.912 | 12.982 | 12.647 | 12.8 |
| 12 | 1.5 | 10.612 | 10.676 | 10.751 | 10.376 | 10.5 |
| 14 | | 12.612 | 12.676 | 12.751 | 12.376 | 12.5 |
| 15 | | 13.612 | 13.676 | 13.751 | 13.376 | 13.5 |
| 16 | | 14.612 | 14.676 | 14.751 | 14.376 | 14.5 |
| 18 | | 16.612 | 16.676 | 16.751 | 16.376 | 16.5 |
| 20 | | 18.612 | 18.676 | 18.751 | 18.376 | 18.5 |
| 22 | | 20.612 | 20.676 | 20.751 | 20.376 | 20.5 |

| 螺 纹 | | | | | | 钻头 直径 |
|------|-----|-----------|--------|--------|----------|----------|
| 公称直径 | 螺距 | 小 直 径 级 别 | | | | |
| | | 5H | 6H | 7H | 5H、6H、7H | |
| | | max | max | max | min | |
| 24 | 1.5 | 22.612 | 22.676 | 22.751 | 22.376 | 22.5 |
| 25 | | 23.612 | 23.676 | 23.751 | 23.376 | 23.5 |
| 18 | 2 | 16.135 | 16.210 | 16.310 | 15.835 | 16.0 |
| 20 | | 18.135 | 18.210 | 18.310 | 17.835 | 18.0 |
| 22 | | 20.135 | 20.210 | 20.310 | 19.835 | 20.0 |
| 24 | | 22.135 | 22.210 | 22.310 | 21.835 | 22.0 |
| 25 | | 23.135 | 23.210 | 23.310 | 22.835 | 23.0 |

表 5 英国标准粗牙惠氏螺纹
B、S、W 攻丝前用的钻头直径 (mm)

| 公称直径 (英寸) | 每英寸牙数 | 钻 头 直 径 | |
|--------------|-------|----------|--------|
| | | 铸铁、青铜、黄铜 | 钢、可锻铸铁 |
| 3/16 | 24 | 3.8 | 3.9 |
| 1/4 | 20 | 5.1 | 5.2 |
| 5/16 | 18 | 6.6 | 6.7 |
| 3/8 | 16 | 8.0 | 8.1 |
| 1/2 | 12 | 10.6 | 10.7 |
| 5/8 | 11 | 13.6 | 13.8 |
| 3/4 | 10 | 16.6 | 16.8 |
| 7/8 | 9 | 19.6 | 19.7 |
| 1 | 8 | 22.3 | 22.5 |
| 1 1/8 | 7 | 25.0 | 25.2 |
| 1 1/4 | 7 | 28.2 | 28.4 |
| 1 1/2 | 6 | 34.0 | 34.2 |
| 1 3/4 | 5 | 39.5 | 39.7 |
| 2 | 4 1/2 | 45.3 | 45.6 |

表 6 英寸制统一粗牙螺纹 UNC 攻丝前用的钻头直径 (mm)

| 公称直径 (英寸) | 螺 纹 | | 小 直 径 级 别 | | | 钻头 直径 |
|--------------|------------|-------|-----------|--------|--------|----------|
| | 每英寸 牙 数 | 螺 距 | 2B | 3B | 2B、3B | |
| | | | max | max | min | |
| No. 1 | 64 | 0.397 | 1.582 | 1.582 | 1.425 | 1.55 |
| No. 2 | 56 | 0.454 | 1.872 | 1.872 | 1.694 | 1.85 |
| No. 3 | 48 | 0.529 | 2.146 | 2.146 | 1.941 | 2.10 |
| No. 4 | 40 | 0.635 | 2.385 | 2.385 | 2.156 | 2.35 |
| No. 5 | 40 | 0.635 | 2.697 | 2.697 | 2.487 | 2.65 |
| No. 6 | 32 | 0.794 | 2.896 | 2.896 | 2.642 | 2.85 |
| No. 8 | 32 | 0.794 | 3.531 | 3.528 | 3.302 | 3.50 |
| No. 10 | 24 | 1.058 | 3.962 | 3.950 | 3.683 | 3.90 |
| No. 12 | 24 | 1.058 | 4.597 | 4.590 | 4.343 | 4.60 |
| 1/4 | 20 | 1.270 | 5.268 | 5.250 | 4.976 | 5.10 |
| 5/16 | 18 | 1.411 | 6.784 | 6.680 | 6.411 | 6.60 |
| 3/8 | 16 | 1.588 | 8.164 | 8.082 | 7.805 | 8.00 |
| 7/16 | 14 | 1.814 | 9.550 | 9.441 | 9.149 | 9.40 |
| 1/2 | 13 | 1.954 | 11.013 | 10.881 | 10.584 | 10.80 |
| 9/16 | 12 | 2.117 | 12.456 | 12.301 | 11.996 | 12.20 |
| 5/8 | 11 | 2.309 | 13.868 | 13.693 | 13.376 | 13.50 |
| 3/4 | 10 | 2.540 | 16.833 | 16.624 | 16.299 | 16.50 |
| 7/8 | 9 | 2.822 | 19.748 | 19.520 | 19.169 | 19.50 |
| 1 | 8 | 3.175 | 22.598 | 22.344 | 21.963 | 22.25 |
| 1 1/8 | 7 | 3.629 | 25.349 | 25.082 | 24.648 | 25.00 |
| 1 1/4 | 7 | 3.629 | 28.524 | 28.258 | 27.823 | 28.00 |
| 1 3/8 | 6 | 4.233 | 31.120 | 30.851 | 30.343 | 30.75 |
| 1 1/2 | 6 | 4.233 | 34.295 | 34.026 | 33.519 | 34.00 |
| 1 3/4 | 5 | 5.080 | 39.814 | 39.560 | 38.951 | 39.50 |
| 2 | 4 1/2 | 5.644 | 45.598 | 45.367 | 44.689 | 45.00 |

表 7 英寸制统一细牙螺纹 UNF 攻丝前用的钻头直径 (mm)

| 公称直径 (英寸) | 每英寸 牙 数 | 螺 距 | 小 直 径 级 别 | | | 钻头 直径 |
|--------------|------------|-------|-----------|--------|--------|----------|
| | | | 2B | 3B | 2B、3B | |
| | | | max | max | min | |
| No. 0 | 80 | 0.318 | 1.306 | 1.306 | 1.181 | 1.25 |
| No. 1 | 72 | 0.353 | 1.613 | 1.613 | 1.473 | 1.55 |
| No. 2 | 64 | 0.397 | 1.913 | 1.913 | 1.755 | 1.90 |
| No. 3 | 56 | 0.454 | 2.197 | 2.197 | 2.024 | 2.15 |
| No. 4 | 48 | 0.529 | 2.459 | 2.459 | 2.271 | 2.40 |
| No. 5 | 44 | 0.577 | 2.741 | 2.741 | 2.550 | 2.70 |
| No. 6 | 40 | 0.635 | 3.023 | 3.012 | 2.819 | 2.95 |
| No. 8 | 36 | 0.706 | 3.607 | 3.597 | 3.404 | 3.50 |
| No. 10 | 32 | 0.794 | 4.166 | 4.168 | 3.962 | 4.10 |
| No. 12 | 28 | 0.907 | 4.724 | 4.717 | 4.496 | 4.70 |
| 1/4 | 28 | 0.907 | 5.580 | 5.563 | 5.367 | 5.50 |
| 5/16 | 24 | 1.058 | 7.038 | 6.995 | 6.792 | 6.90 |
| 3/8 | 24 | 1.058 | 8.626 | 8.565 | 8.379 | 8.50 |
| 7/16 | 20 | 1.270 | 10.030 | 9.947 | 9.738 | 9.90 |
| 1/2 | 20 | 1.270 | 11.618 | 11.524 | 11.326 | 11.50 |
| 9/16 | 18 | 1.411 | 13.084 | 12.969 | 12.761 | 12.90 |
| 5/8 | 18 | 1.411 | 14.671 | 14.554 | 14.348 | 14.50 |
| 3/4 | 16 | 1.588 | 17.689 | 17.546 | 17.330 | 17.50 |
| 7/8 | 14 | 1.814 | 20.663 | 20.493 | 20.262 | 20.40 |
| 1 | 12 | 2.117 | 23.569 | 23.363 | 23.109 | 23.25 |
| 1 1/8 | 12 | 2.117 | 26.744 | 26.538 | 26.284 | 26.50 |
| 1 1/4 | 12 | 2.117 | 29.919 | 29.713 | 29.459 | 29.50 |
| 1 3/8 | 12 | 2.117 | 33.094 | 32.888 | 32.634 | 32.75 |
| 1 1/2 | 12 | 2.117 | 36.269 | 36.063 | 35.809 | 36.00 |

表 8 GB7307-87、ISO228/1-1982 非螺纹密封的管螺纹
攻丝前用的钻头直径(mm)

| 螺 | | | 纹 | | 钻头 直径 |
|--------------|------------|-------|--------|--------|----------|
| 公称直径 (英寸) | 每英寸 牙 数 | 螺 距 | 小 直 径 | | |
| | | | max | min | |
| 1/8 | 28 | 0.907 | 8.848 | 8.566 | 8.80 |
| 1/4 | 19 | 1.337 | 11.890 | 11.445 | 11.80 |
| 3/8 | 19 | 1.337 | 16.395 | 14.950 | 15.25 |
| 1/2 | 14 | 1.814 | 19.172 | 18.631 | 19.00 |
| 5/8 | 14 | 1.814 | 21.128 | 20.587 | 21.00 |
| 3/4 | 14 | 1.814 | 24.658 | 24.117 | 24.50 |
| 7/8 | 14 | 1.814 | 28.418 | 27.877 | 28.25 |
| 1 | 11 | 2.309 | 30.931 | 30.291 | 30.75 |
| 1 1/4 | 11 | 2.309 | 39.592 | 38.952 | 39.50 |
| 1 1/2 | 11 | 2.309 | 45.485 | 44.845 | 45.00 |
| 1 3/4 | 11 | 2.309 | 51.428 | 50.788 | 51.00 |
| 2 | 11 | 2.309 | 75.296 | 56.556 | 57.00 |

表 9 GB7306-87、ISO7/1-1982 用螺纹密封的管螺纹
攻丝前用的钻头直径 (mm)

| 螺 | | | 纹 | | 钻头 直径 |
|--------------|------------|-------|--------|--------|----------|
| 公称直径 (英寸) | 每英寸 牙 数 | 螺 距 | 小 直 径 | | |
| | | | max | min | |
| 1/8 | 28 | 0.907 | 8.637 | 8.495 | 8.60 |
| 1/4 | 19 | 1.337 | 11.549 | 11.341 | 11.50 |
| 3/8 | 19 | 1.337 | 15.054 | 14.846 | 15.00 |
| 1/2 | 14 | 1.814 | 18.773 | 18.489 | 18.50 |
| 3/4 | 14 | 1.814 | 24.259 | 23.975 | 24.00 |
| 1 | 11 | 2.309 | 30.471 | 30.111 | 30.25 |
| 1 1/4 | 11 | 2.309 | 39.132 | 38.772 | 39.00 |
| 1 1/2 | 11 | 2.309 | 45.025 | 44.665 | 45.00 |
| 2 | 11 | 2.309 | 56.836 | 56.476 | 56.50 |

表 10 美标 (NPT、NPSC) 管螺纹底孔推荐的麻花钻直径 (英寸)

| 公称直径 | 锥 螺 纹 | | | | 直管螺纹 | |
|-------|-------------|--------|---------|--------|---------|--------|
| | 使用铰刀 | | 不用铰刀 | | | |
| 1 | 2 | | 3 | | 4 | |
| 1/16 | | *0.240 | | *0.246 | 1/4 | *0.250 |
| 1/8 | 21/64 | *0.328 | | *0.332 | 11/32 | *0.344 |
| 1/4 | 27/64 | *0.422 | 7/16 | *0.438 | 7/16 | *0.438 |
| 3/8 | 9/16 | *0.562 | 9/16 | *0.562 | 37/64 | *0.578 |
| 1/2 | 11/16 | *0.688 | 45/64 | *0.703 | 23/32 | *0.719 |
| 3/4 | 57/64 | *0.891 | 29/32 | *0.906 | 59/64 | *0.922 |
| 1 | 1 1/2 | *1.125 | 1 9/64 | *1.141 | 1 5/32 | *1.156 |
| 1 1/4 | 1 15/32 | 1.469 | 1 31/64 | 1.484 | 1 1/2 | 1.500 |
| 1 1/2 | 1 23/32 | 1.719 | 1 47/64 | 1.734 | 1 3/4 | 1.750 |
| 2 | 2 3/16 | 2.188 | 2 13/64 | 2.203 | 2 7/32 | 2.219 |
| 2 1/2 | 2 19/32 | 2.594 | 2 5/8 | 2.625 | 2 21/32 | 2.656 |

注：*为美国标准麻花钻尺寸

表 11 美标 (NPTF、NPSI) 干密封管螺纹底孔推荐的
麻花钻直径 (英寸)

| 公称直径 | 锥 螺 纹 | | | | 直管螺纹 | |
|-------|-------------|--------|---------|--------|--------|--------|
| | 使用铰刀 | | 不用铰刀 | | | |
| 1 | 2 | | 3 | | 4 | |
| 1/16 | | *0.234 | | *0.246 | 1/4 | *0.250 |
| 1/8 | 21/64 | *0.328 | | *0.339 | *11/32 | *0.344 |
| 1/4 | 27/64 | *0.422 | 7/16 | *0.436 | | *0.444 |
| 3/8 | 9/16 | *0.562 | 27/64 | *0.578 | 27/64 | *0.578 |
| 1/2 | 11/16 | *0.688 | 45/64 | *0.703 | 23/32 | *0.719 |
| 3/4 | 57/64 | *0.891 | 59/64 | *0.922 | *59/64 | *0.922 |
| 1 | 1 1/8 | *1.125 | 1 5/32 | *1.156 | 1 5/32 | *1.156 |
| 1 1/4 | 1 15/32 | 1.469 | 1 1/2 | 1.500 | | |
| 1 1/2 | 1 45/64 | 1.703 | 1 47/64 | 1.734 | | |
| 2 | 2 3/16 | 2.188 | 2 7/32 | 2.219 | | |
| 2 1/2 | 2 19/32 | 2.594 | 2 41/64 | 2.641 | | |
| 3 | 3 7/32 | 3.219 | 3 17/64 | 3.266 | | |

注：*为美国标准麻花钻尺寸